


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PATENT COOPERATION TREATY
PCT
INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference MH504102-142	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. PCT/NZ2003/000220	International Filing Date (day/month/year) 30 September 2003	Priority Date (day/month/year) 30 September 2002
International Patent Classification (IPC) or national classification and IPC Int. Cl. 7 B65D 1/02, 1/40		
Applicant CO2 PAC LIMITED et al		

1.	This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2.	<p>This REPORT consists of a total of 3 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 7 sheet(s).</p>
3.	<p>This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>

Date of submission of the demand 16 April 2004	Date of completion of the report 11 January 2005
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer  ADRIANO GIACOBETTI Telephone No. (02) 6283 2579

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/NZ.2003/000220

I. Basis of the report

1. With regard to the elements of the international application:*

- ☐ the international application as originally filed.
- ☒ the description, pages 1-4, 8-16 as originally filed,
pages , filed with the demand,
pages 5,6,7 received on 21 December 2004 with the letter of 21 December 2004
- ☒ the claims, pages , as originally filed,
pages , as amended (together with any statement) under Article 19,
pages , filed with the demand,
pages 17-20 received on 21 December 2004 with the letter of 21 December 2004
- ☒ the drawings, pages 1/15-15/15 as originally filed,
pages , filed with the demand,
pages , received on with the letter of
- ☐ the sequence listing part of the description:
pages , as originally filed
pages , filed with the demand
pages , received on with the letter of

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/fig.

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/NZ2003/000220

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims 1-35	YES
	Claims	NO
Inventive step (IS)	Claims 1-35	YES
	Claims	NO
Industrial applicability (IA)	Claims 1-35	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)Cited Prior Art Documents

D1: US 4880129 D2: WO 1993/012975
D3: WO 1999/021770 D4: WO 1997/003885
D5: JP 64-009146 D6: WO 2002/018213

NOVELTY(N) AND INVENTIVE STEP(IS): Claims 1-35 (YES)

The invention of claim 1 relates to a container having at least one substantially transversely orientated pressure panel portion located in a lower portion, and the pressure panel portion being capable of folding from one longitudinally inclined position to an inverted position to compensate for a change of pressure induced within the container.

The closest prior art documents (D1) and (D2) each disclose a hot-fill type container or bottle having a pressure or vacuum panel portion in the base area which is capable of deflecting both inward and outward in order to provide adequate volumetric expansion and contraction (ie change of internal container pressures) of filled sealed containers.

However, none of the documents above disclose the pressure panel portion within the base portion including an initiator portion and a control portion wherein the initiator portion provides for folding before the control portion. Therefore it is considered that the present documents (D1) to (D6) do not disclose or fairly suggest this arrangement and hence the invention of claim 1, and appended claims 2 to 35, is considered to be novel and involves an inventive step.

Consequently the invention defined in claims 1 to 35 meets the requirements of Articles 33(2) and 33(3) of the PCT with regard to novelty and inventive step.

INDUSTRIAL APPLICABILITY(IA): Claims 1-35 (YES)

The invention defined in claims 1 to 35 meets the requirements of industrial applicability under Article 33(4) of the PCT because the container can be made or used in industry.

that further prevent panel roll-out, or initiator region configurations utilized that optimize for resistance to such reversion displacement.

5 **Objects Of The Invention**

In view of the above, it is an object of one preferred embodiment of the present invention to provide a plastic container structure having a transversely oriented pressure panel in its lower portion that can provide for removal of vacuum pressure such that there is substantially no remaining force within the container.

It is a further object of one preferred embodiment of the present invention to provide a container which has a transversely oriented pressure panel that is decoupled to a degree from the adjoining wall such that greater inward and longitudinal movement can be achieved.

It is a further object of one preferred embodiment of the present invention to provide for a container to have a transversely oriented pressure panel that is inwardly displaced to a position above the standing ring of the final container configuration, such that a new base region is formed with a greater standing ring or foot print area, and the pressure panel is substantially protected from top load force applied to the container during commercial distribution.

It is a further object of one preferred embodiment of the present invention to provide for an improved transversely oriented pressure panel having an initiator portion which may utilize essentially the same angle as the control portion, such that greater removal of vacuum pressure can be obtained and such that greater resistance to outward deflection can also be obtained.

A further and alternative object of the present invention in all its embodiments, all the objects to be read disjunctively, is to at least provide the public with a useful choice.

Summary Of The Invention

According to one aspect of the present invention there is provided a container having a longitudinal axis, an upper portion having an opening into said container, a body portion extending from said upper portion to a base portion,

said base portion closing off an end of said container, said container having at least one substantially transversely oriented pressure panel portion located in said base portion, said pressure panel portion being capable of folding from one longitudinally inclined position to an inverted position to compensate for a change of pressure induced within the container, said pressure panel portion including an initiator portion and a control portion, said initiator portion having less resistance to pressure folding forces and providing for folding before the control portion.

According to a further aspect of the present invention a container as defined in the paragraph immediately above has at least one substantially transversely oriented vacuum panel portion located wherein said base, said vacuum panel portion being adapted in use to fold from a longitudinally inclined position to an inverted position to compensate for a change of pressure induced within the container following cooling of a liquid within the container after it has been capped, such that less force is exerted on the internal walls of said container.

According to a further aspect of the present invention a container as defined in the paragraph immediately above, has a single substantially transversely oriented vacuum panel portion located within the base and joined to a side wall of the container by a decoupling or hinge structure, said vacuum panel portion being adapted in use to fold from a longitudinally inclined position to an inverted position to compensate for a change of pressure induced within the container.

Preferably in one embodiment a decoupling structure connects the pressure panel portion with the body portion and is of an area which allows for greater inward and upward longitudinal movement of the pressure panel.

Preferably in one embodiment the vacuum panel portion has no strengthening ribs to restrain substantial longitudinal movement and inversion.

Preferably in one embodiment the vacuum panel portion may include fluting structures or the like to allow an even circumferential distribution of folding forces to provide for increased control over folding the panel portion from one inclined position to another and to assist in preventing unwanted return to the original position.

Preferably in one embodiment after folding, the container standing support is provided by a lower part of the container sidewall that provides a replacement container standing support.

5 According to a further aspect of the invention a method of compensating for a change in pressure in a container as defined in any one of the preceding seven paragraphs is provided in which said method includes applying a force to the or each said panel portion to cause said folding to occur.

10 According to a further aspect of this invention there is provided a hot-fill container substantially as herein described with reference to any one of the embodiments of the accompanying drawings.

15 Further aspects of the invention which should be considered in all its novel aspects will become apparent from the following description.

Brief Description of Drawings

20 **Figure 1:** shows a cross-sectional view of a hot-fill container according to one possible embodiment of the invention in its pre-collapsed condition;

Figure 2: shows the container of Figure 1 in its collapsed position;

25 **Figure 3:** shows the base of Figure 1 before collapsing;

Figure 4: shows the base of Figure 2 following collapsing;

30 **Figure 5:** shows an underneath view of the base of the container of Figure 1 before collapsing.

Figure 6: shows the base of Figure 1 before collapsing;

Figure 7: shows the base of Figure 2 following collapsing;

35 **Figure 8a:** shows a cross-sectional view of a hot-fill container according to an

CLAIMS:

1. A container having a longitudinal axis, an upper portion having an opening into
5 said container, a body portion extending from said upper portion to a base portion,
said base portion closing off an end of said container, said container having at
least one substantially transversely oriented pressure panel portion located in said
base portion, said pressure panel portion being capable of folding from one
longitudinally inclined position to an inverted position to compensate for a change
10 of pressure induced within the container, said pressure panel portion including an
initiator portion and a control portion, said initiator portion having less resistance to
pressure folding forces and providing for folding before the control portion.
2. A container as claimed in claim 1 wherein said pressure panel portion is adapted
15 to resist being expanded from the inverted position.
3. A container as claimed in claim 1 wherein the initiator portion has a less acute
angle than the control portion relative to the longitudinal axis.
- 20 4. A container as claimed in claim 3 wherein the initiator portion causes said control
portion to invert and flex further inwardly into the container.
5. A container as claimed in claim 1 wherein said pressure panel portion provides
compensation of vacuum pressure induced, in use, within the container following
25 cooling of a heated liquid within the container after it has been capped, such that
there remains substantially no vacuum pressure inside the container.
6. A container as claimed in claim 5 wherein said pressure panel portion is adapted
in use to invert longitudinally under an externally applied mechanical force.
- 30 7. A container as claimed in claim 1 wherein said initiator portion is located adjacent
to the widest periphery of the pressure panel portion.
8. A container as claimed in claim 1 wherein said pressure panel portion is of variable
35 width and inverts from its widest portion to its narrowest portion.

9. A container as claimed in claim 8 wherein said initiator portion has an angular
indination relative to said longitudinal axis which is substantially the same as that
of the control portion.
- 5
10. A container as claimed in claim 1 wherein said pressure panel portion is adapted
to cause said base to retract longitudinally further into said body portion.
11. A container as claimed in claim 10 wherein said pressure panel portion is adapted
to cause a lowest portion of said base portion to be replaced as the structure
providing a standing support for the container.
- 10
12. A container as claimed in claim 11 wherein its structure is such that in use a top
load applied to the container is transferred from said base to a portion of a sidewall
of the container.
- 15
13. A container as claimed in claim 1 wherein said pressure panel portion is connected
with a lower portion of a sidewall of the container by a decoupling or hinge
structure.
- 20
14. A container as claimed in claim 1 wherein said pressure panel portion includes
outwardly projecting portions.
15. A container as claimed in claim 1 wherein said pressure panel portion includes
inwardly projecting portions.
- 25
16. A container as claimed in claim 1 wherein said pressure panel portion is adapted
in use to remove vacuum induced, in use, in the container such that substantially
no vacuum remains.
- 30
17. A container as claimed in claim 3 wherein said control portion is outwardly inclined
at an angle of more than 10° relative to a plane orthogonal to said longitudinal axis.
18. A container as claimed in claim 17 wherein said angle is between 30° and 45° and
the angle of the initiator portion is at least 10° less.
- 35

19. A container as claimed in claim 1 wherein said base portion further includes a substantially centrally located upwardly projecting further base portion joined adjacent to an inside border of the pressure panel and closing off a bottom of the container.
20. A container as claimed in claim 19 wherein said upwardly projecting further base portion is adapted to move upwardly when the pressure panel inverts.
21. A container as claimed in claim 1 wherein said pressure panel portion is adapted in use to provide compensation for internal pressure induced within the container following heating of a liquid within said container after it has been capped.
22. A container as claimed in claim 21 wherein said pressure panel portion is adapted in use to subsequently provide compensation for reduced pressure induced within the container following cooling of said liquid within the capped container, such that less force is exerted on the internal walls of said container.
23. A container as claimed in claim 1, said container having at least one substantially transversely oriented vacuum panel portion within said base, said vacuum panel portion being adapted in use to fold from a longitudinally inclined position to an inverted position to compensate for a change of pressure induced within the container following cooling of a liquid within the container after it has been capped, such that less force is exerted on the walls of said container.
24. A container as claimed in claim 1 wherein a single substantially transversely oriented vacuum panel portion is located within the base and is joined to a side wall of the container by a decoupling or hinge structure, said vacuum panel portion being adapted in use to fold from a longitudinally inclined position to an inverted position to compensate for a change of pressure induced within the container.
25. A container as claimed in Claim 1 in which the pressure panel portion includes a plurality of flutes forming a conical area in the base.
26. A container as claimed in claim 25 in which alternate flutes are inclined at a greater or lesser angle relative to the longitudinal axis.
27. A container as claimed in claim 25 in which the flutes are outwardly convex.

28. A container as claimed in claim 25 in which the flutes are inwardly concave.
29. A container as claimed in Claim 1 and further including a standing ring surrounding
said pressure panel for providing container stability when the pressure panel is in
an inverted position.
30. A container as claimed in Claim 29 and further including a recessed instep
adjacent to an inside border of said standing ring, said instep surrounding the
pressure panel portion and being displaced higher within the container than an
upper border of the pressure panel.
31. A container as claimed in Claim 1 whereby the pressure panel has no
strengthening ribs to restrain substantial longitudinal movement and inversion.
32. A method of compensating for a change in pressure induced within a container
according to claim 1 in which said method includes applying a force to the or each
said pressure panel portion to cause said folding to occur.
33. A container as claimed in claim 29 and further including a recessed instep
adjacent to an inside border of said standing ring, and a decoupling structure
connecting an adjacent widest border of the pressure panel portion with said
instep, said decoupling structure providing for greater inward and upward
longitudinal movement of the pressure panel.
34. A container as claimed in claim 33 wherein said decoupling structure is relatively
flat when compared to the longitudinal axis.
35. A container as claimed in claim 33 wherein said decoupling structure is relatively
non-ribbed, and separates the widest point of the pressure panel from said
recessed instep.